

SEAMONSTER: A wireless Sensor Web prototype applied to studying glaciated watersheds

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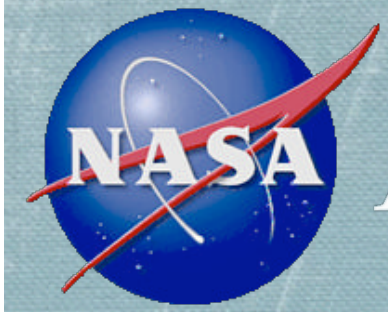

Acknowledgements

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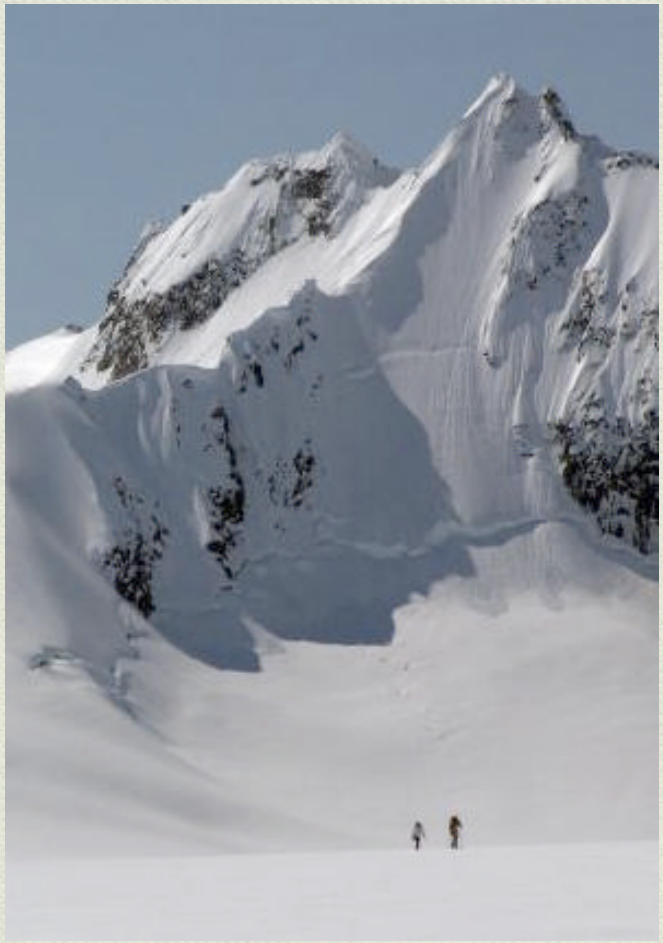
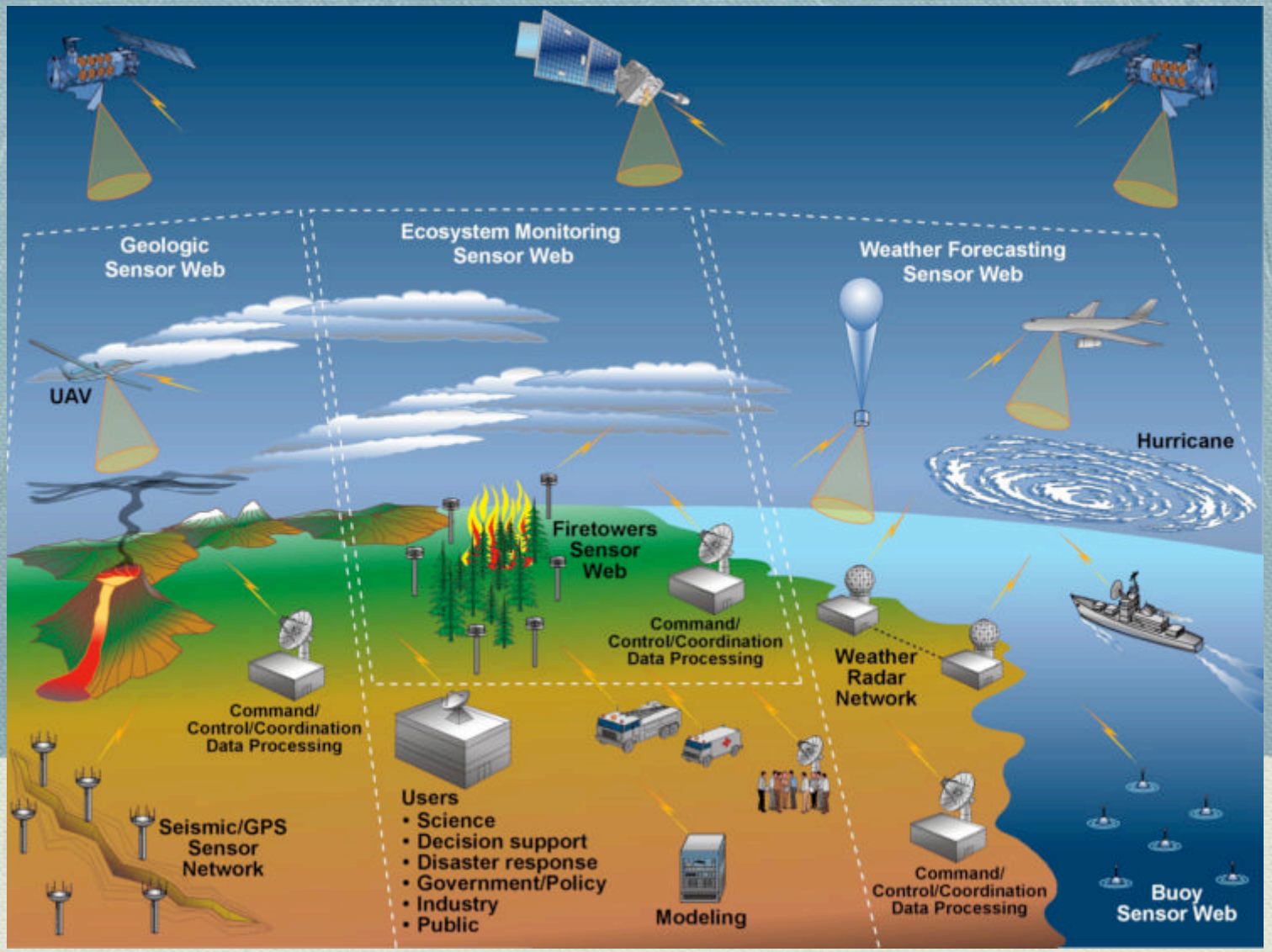
- North Star, Era, Coastal, Temsco - helicopter support

Acknowledgements

Overview

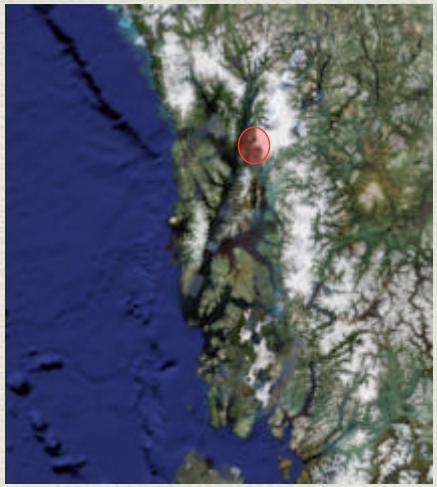
- Science & Technology
  - Southeast Alaska
  - Science Motivation
  - SEAMONSTER
- Outcomes of Project
- Lessons Learned
- Future

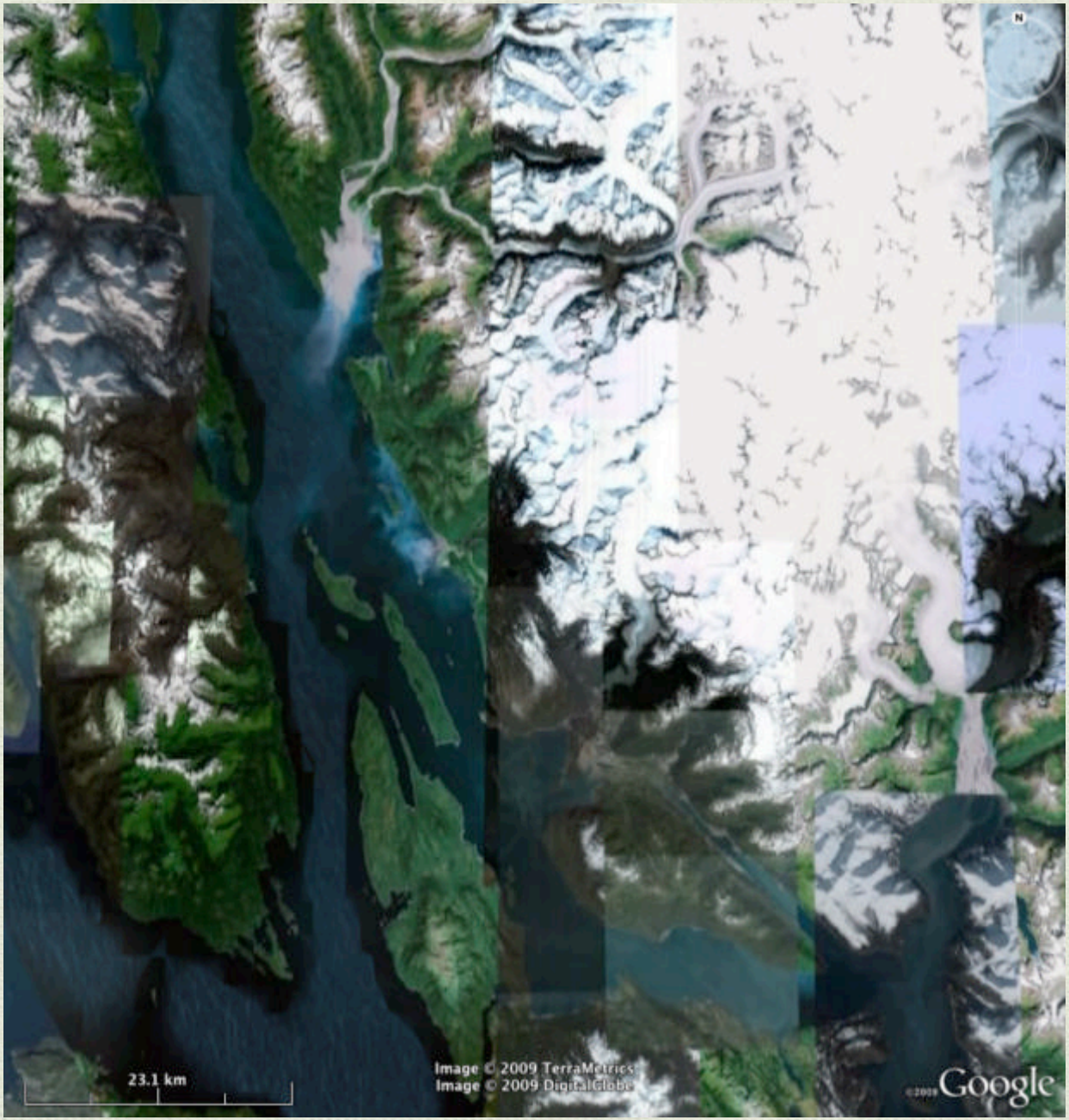




AIST PI Workshop 2/2007

Sensor Web Concept




23.1 km
Image © 2009 TerraMetrics
Image © 2009 DigitalGlobe
©2009 Google

Science Motivation

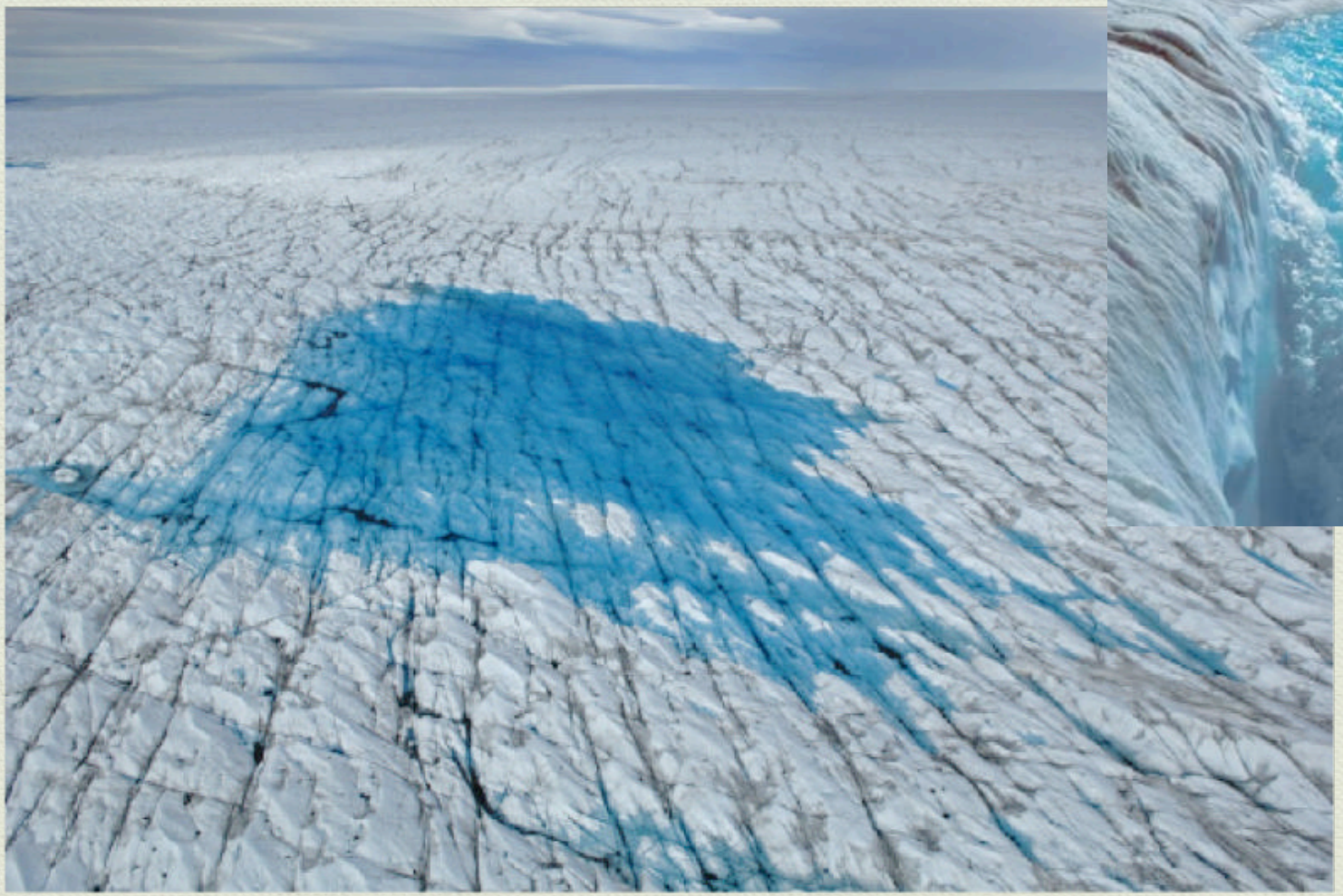
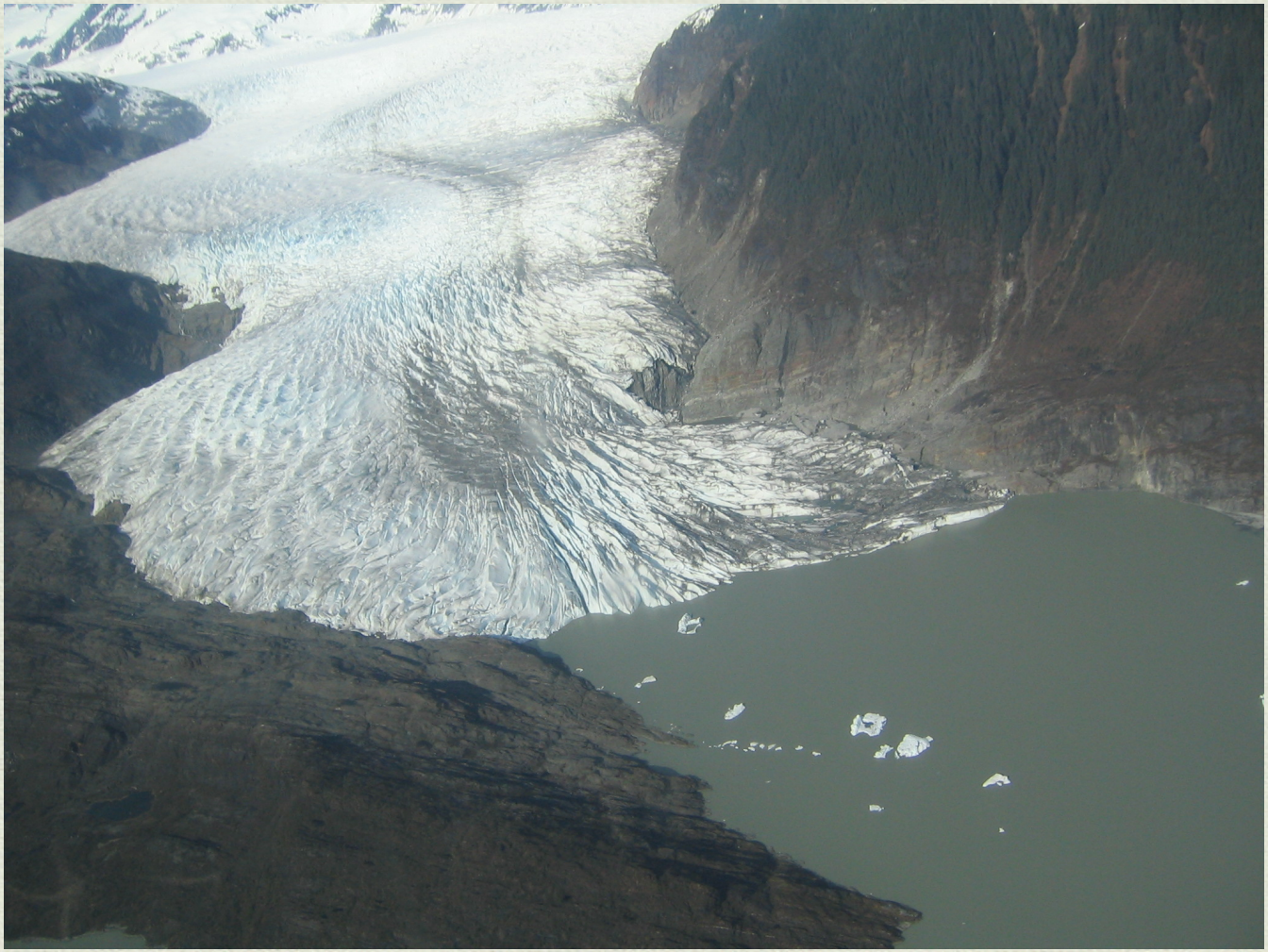
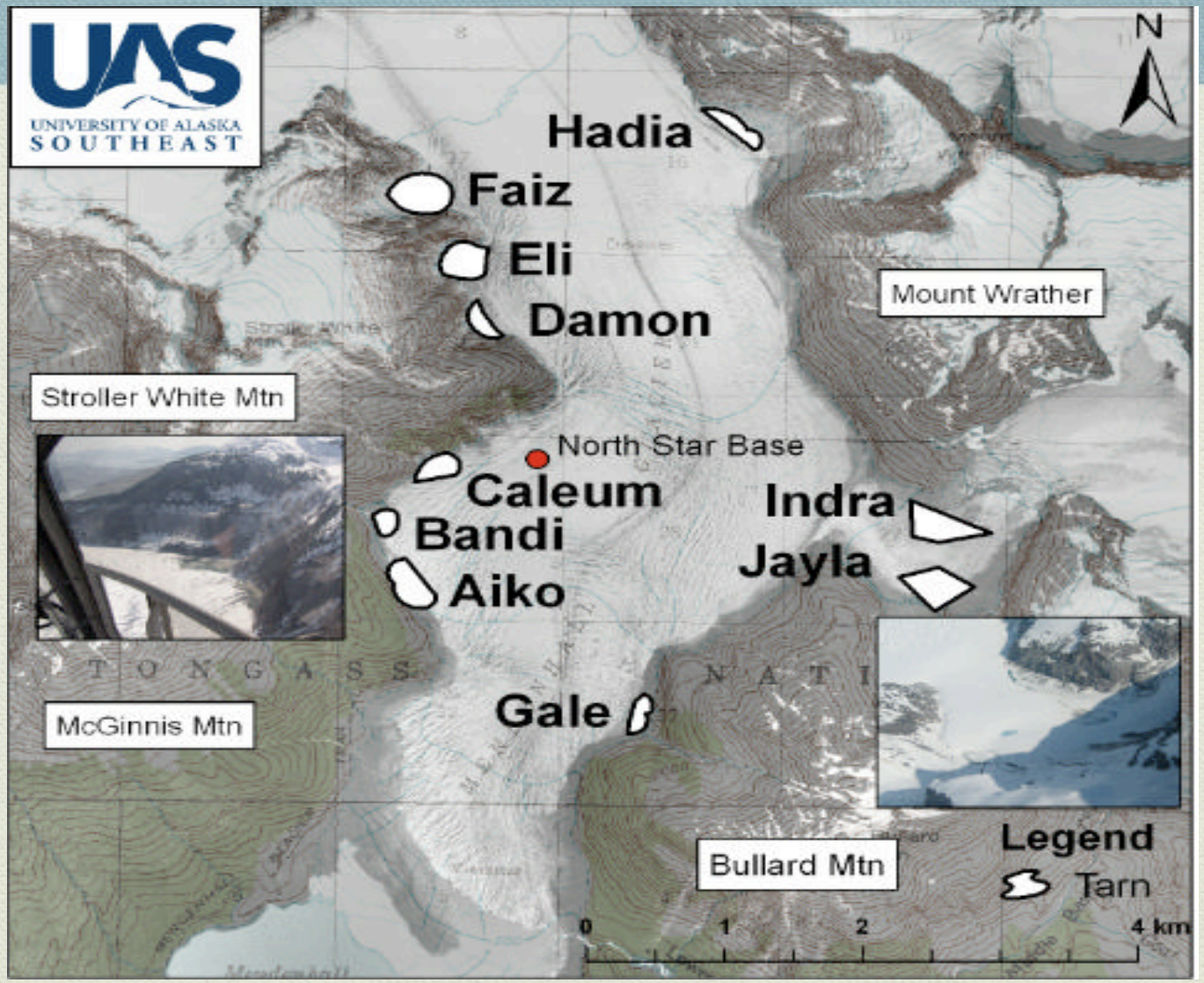


Photo Credit: James Balog, EIS

Science Motivation



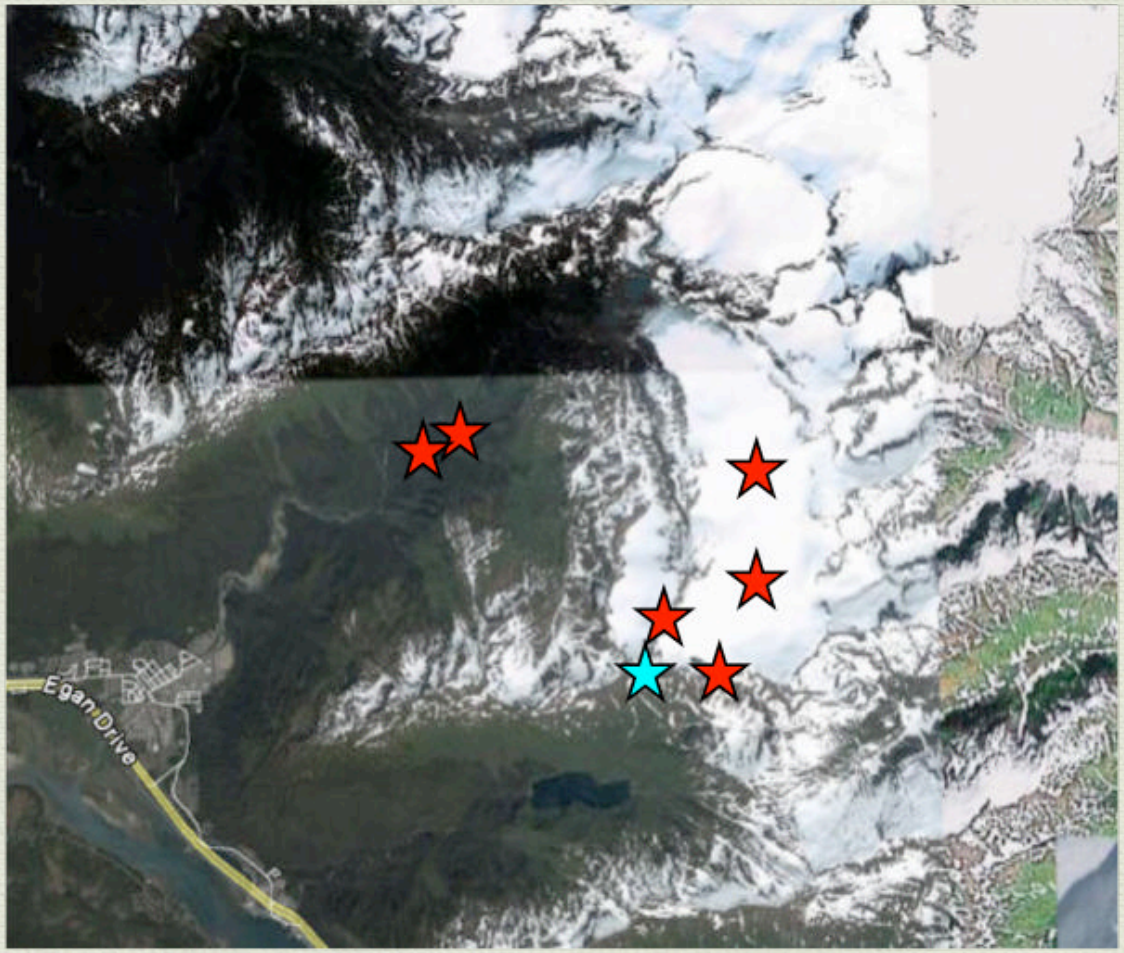
Science Motivation



SEAMONSTER

- South
- East
- Alaska
- MOnitoring
- Network for
- Science
- Technology
- Education &
- Research

Lemon Creek Sensor Web



Lemon Creek Glacier

Lower Lemon Met Station

Instrumentation

Lake Level

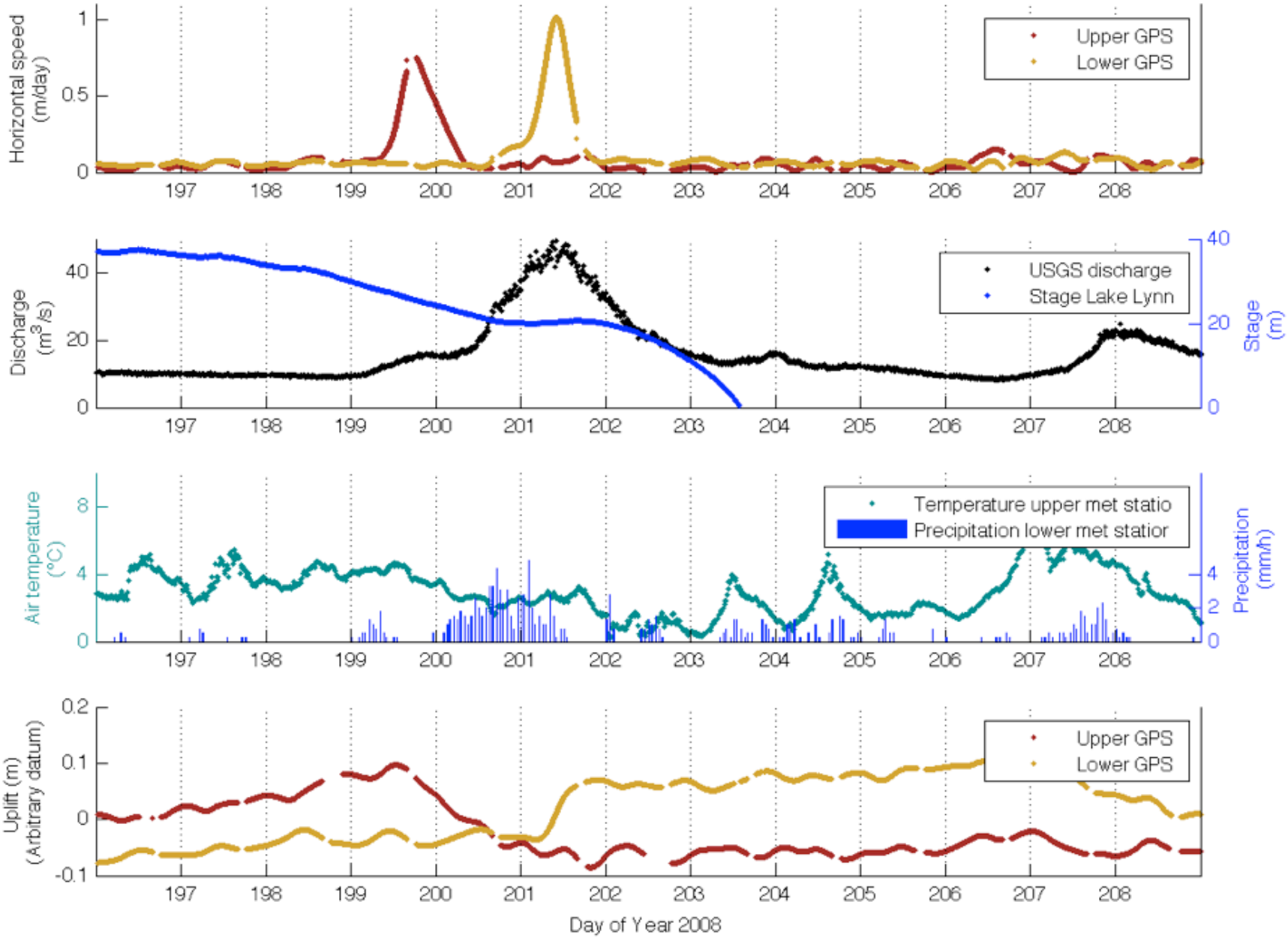
Climate

Water Quality

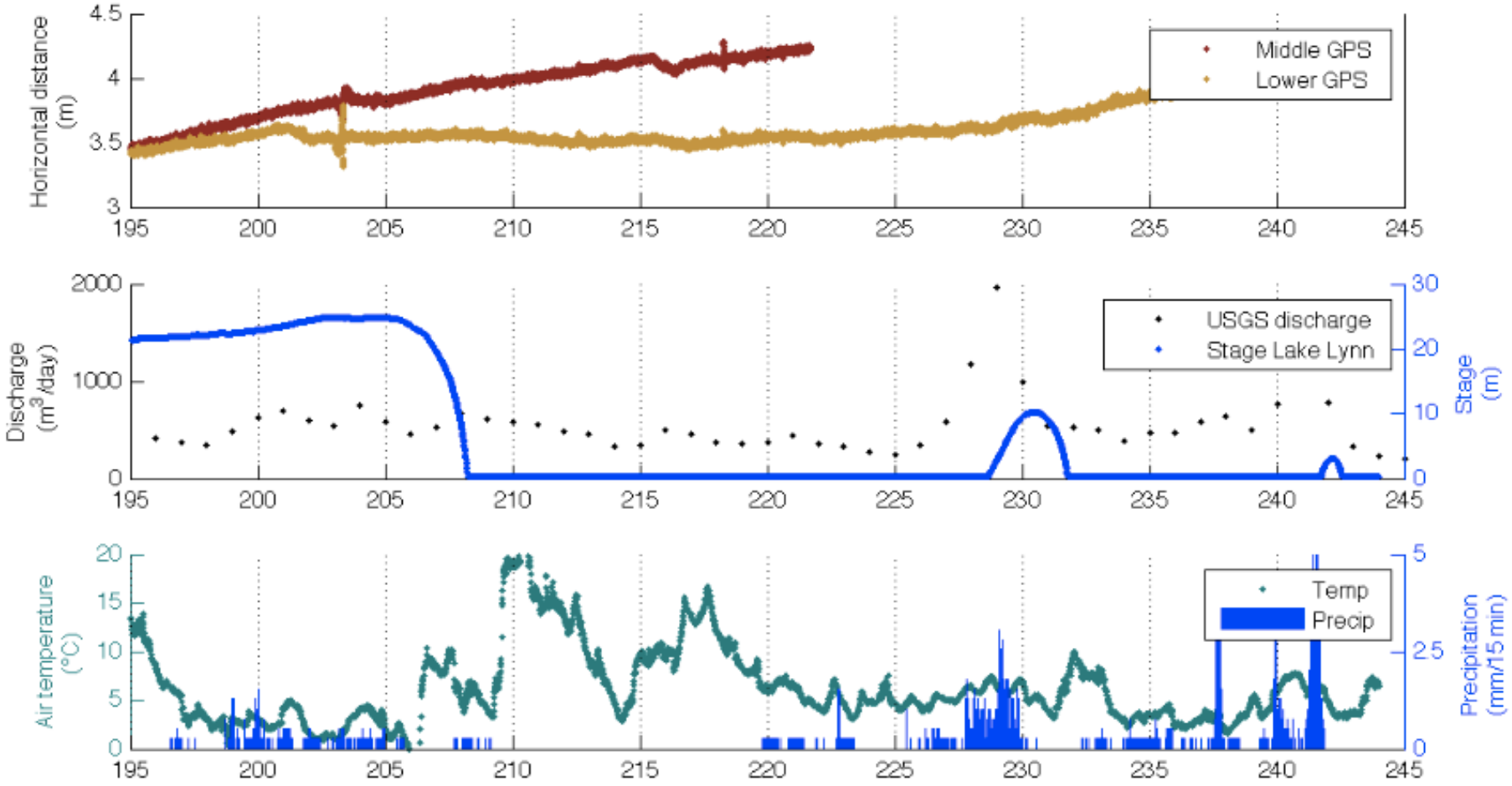
GPS/Seismic

Cameras

Lemon Creek 2008



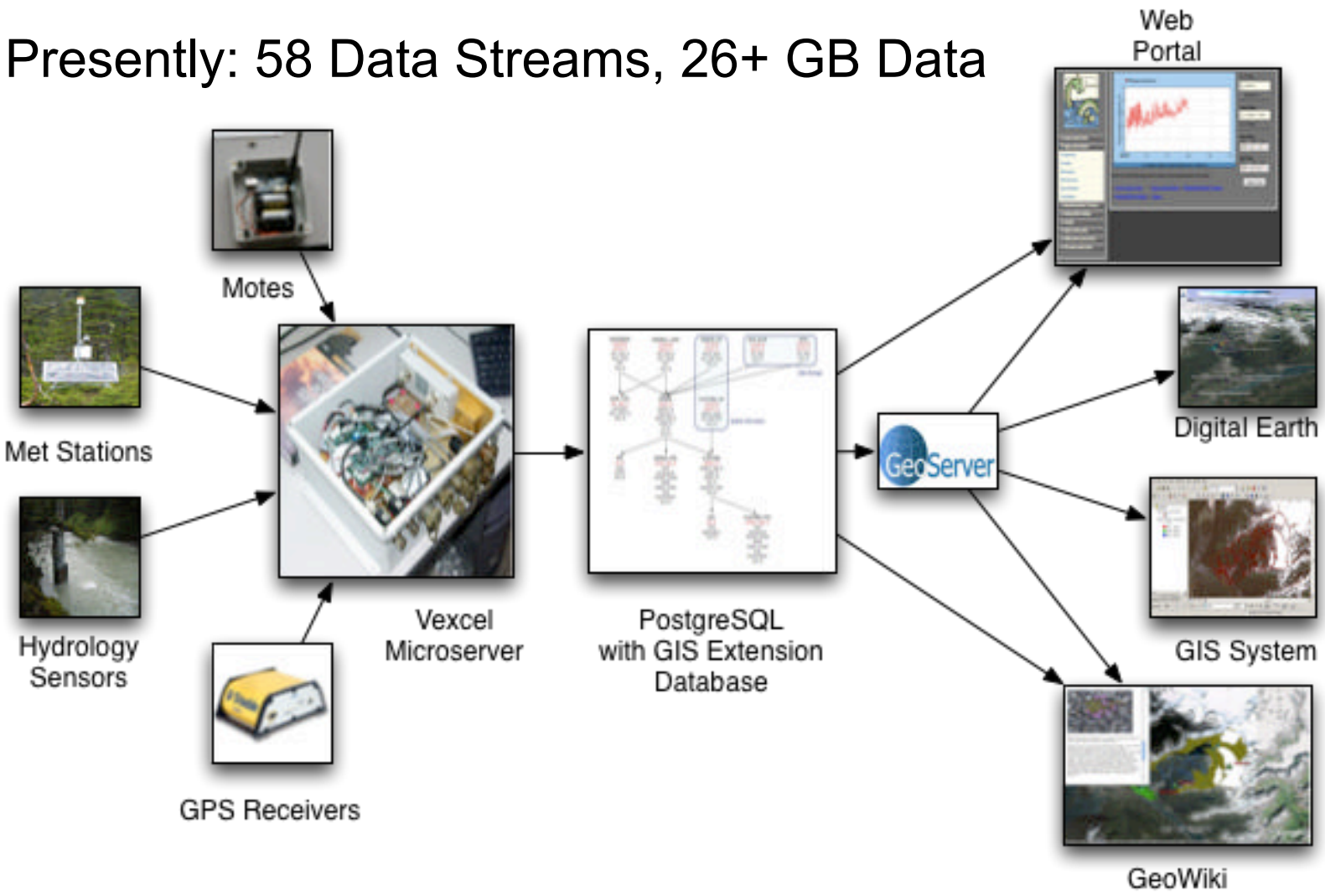
Lemon Creek 2009

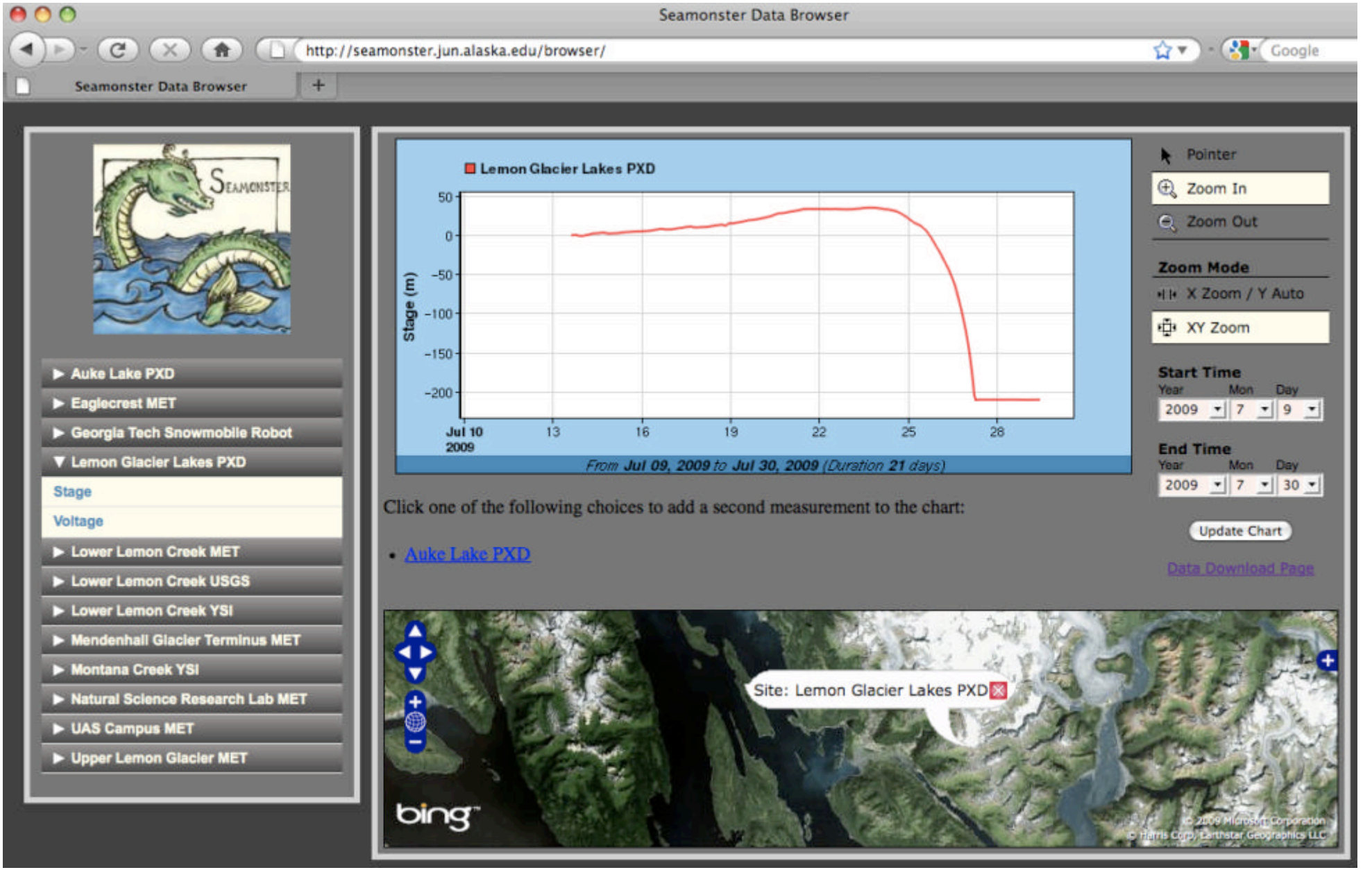


Database and Access

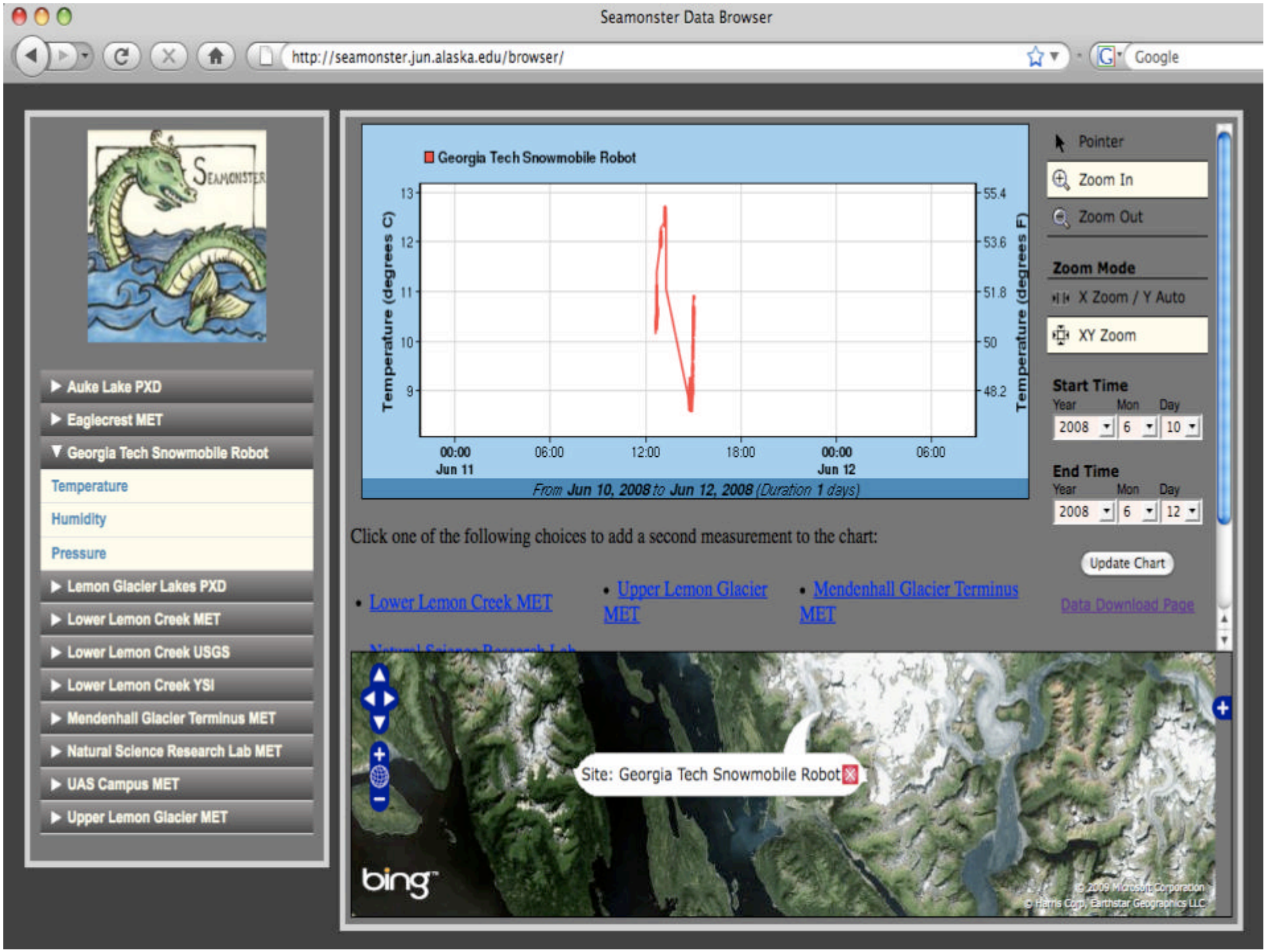
http://seamonster.jun.alaska.edu:8080/geoserver/mapPreview.do

Presently: 58 Data Streams, 26+ GB Data




Seamonster Data Browser
http://seamonster.jun.alaska.edu/browser/
Google
Seamonster Data Browser
Auke Lake PXD
Eaglecrest MET
Georgia Tech Snowmobile Robot
Lemon Glacier Lakes PXD
Stage
Voltage
Lower Lemon Creek MET
Lower Lemon Creek USGS
Lower Lemon Creek YSI
Mendenhall Glacier Terminus MET
Montana Creek YSI
Natural Science Research Lab MET
UAS Campus MET
Upper Lemon Glacier MET
Lemon Glacier Lakes PXD
Stage (m)
50
0
-50
-100
-150
-200
Jul 10
2009
13
16
19
22
25
28
From Jul 09, 2009 to Jul 30, 2009 (Duration 21 days)
Pointer
Zoom In
Zoom Out
Zoom Mode
X Zoom / Y Auto
XY Zoom
Start Time
Year
Mon
Day
2009
7
9
End Time
Year
Mon
Day
2009
7
30
Update Chart
Data Download Page
Click one of the following choices to add a second measurement to the chart:
Auke Lake PXD
Site: Lemon Glacier Lakes PXD
bing


NASA
Dr. Ayanna
Howard, Georgia
Tech


Seamonster Data Browser
http://seamonster.jun.alaska.edu/browser/
Google
Auke Lake PXD
Eaglecrest MET
Georgia Tech Snowmobile Robot
Temperature
Humidity
Pressure
Lemon Glacier Lakes PXD
Lower Lemon Creek MET
Lower Lemon Creek USGS
Lower Lemon Creek YSI
Mendenhall Glacier Terminus MET
Natural Science Research Lab MET
UAS Campus MET
Upper Lemon Glacier MET
Georgia Tech Snowmobile Robot
Temperature (degrees C)
Temperature (degrees F)
13
12
11
10
9
55.4
53.6
51.8
50
48.2
00:00 Jun 11
06:00
12:00
18:00
00:00 Jun 12
06:00
From Jun 10, 2008 to Jun 12, 2008 (Duration 1 days)
Pointer
Zoom In
Zoom Out
Zoom Mode
X Zoom / Y Auto
XY Zoom
Start Time
Year Mon Day
2008 6 10
End Time
Year Mon Day
2008 6 12
Update Chart
Data Download Page
Click one of the following choices to add a second measurement to the chart:
Lower Lemon Creek MET
Upper Lemon Glacier MET
Mendenhall Glacier Terminus MET
Site: Georgia Tech Snowmobile Robot
bing
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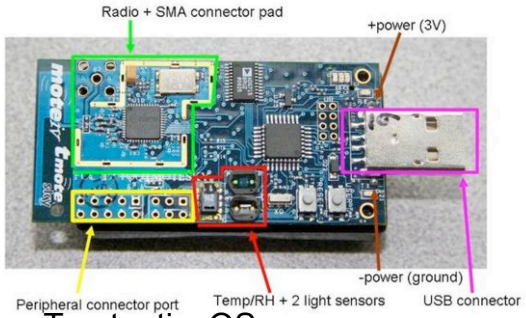
Platforms

Vexcel Microserver, Linux

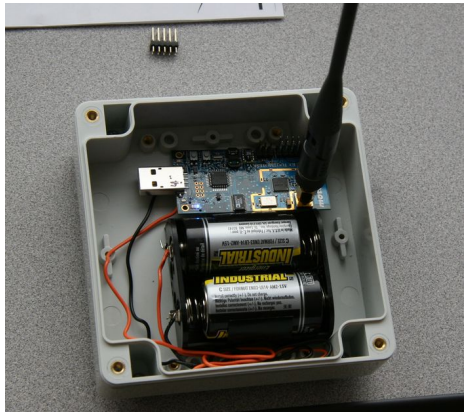
Linksys NSLU-2, a UAS testbed platform, Linux

There are three different platforms in use, with relative computation, storage, and sensing capabilities as well as power requirements and cost.



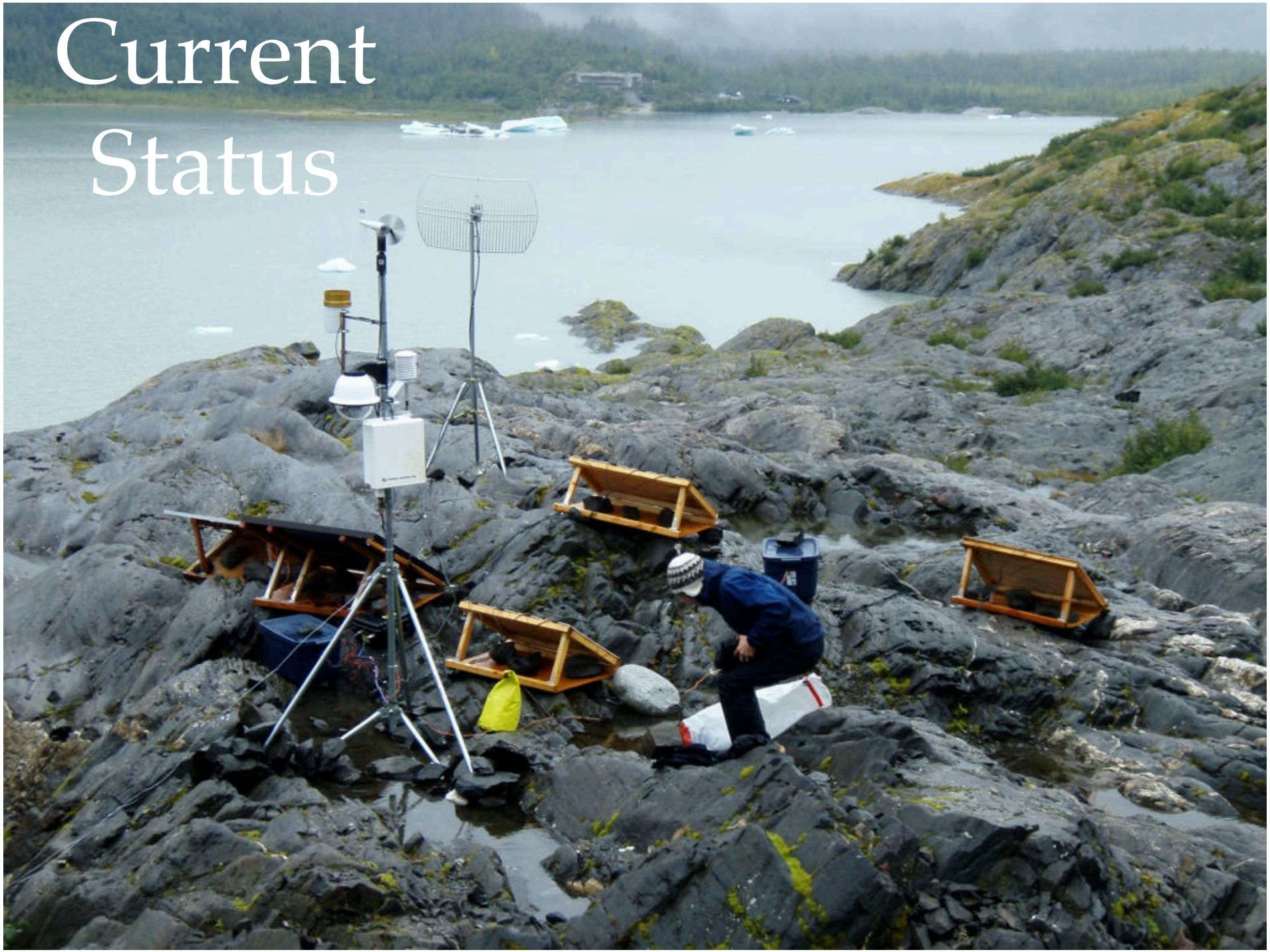
Tmote, tinyOS

Deployment-ready tmote



Current Status

Current Status



Project Outcomes

- Sensor Web Concept Demonstrated
- Testbed Sensor Web
  - Snomotes
  - MACRO
  - NOAA - Earth Information System
- Glacier Hydrology Science
- University and Public Concept

Project Reflections

- **2008 summer of harsh weather impeded Lemon Creek Work**
- **Focus on "Tier One" Microservers**
- **Unanticipated collaborations were significant project outcome**
- **Student Involvement**

All SEAMONSTER code, results, and methods are available online through our project wiki, outreach wiki, data browser, and svn code repository.
http://seamonsterak.com/

Thank you for your attention!

Questions?